



Lowell Regional Wastewater  
451 First Street Boulevard  
Lowell, MA 01854  
Attn: Aaron Fox

7/2/2019

Dear Mr. Fox,

Enclosed please find the toxicological evaluation and chemical analyses report for the effluent received on June 11, 2019. This is your 2<sup>nd</sup> 2019 Stormwater bioassay report. Please call me at (401) 353-3420 if you have any questions.

Sincerely,

Michael McCallum  
Technical Laboratory Director

NEW ENGLAND TESTING LABORATORY, INC.

59 Greenhill St., West Warwick, RI 02893

(401) 353-3420

TOXICOLOGICAL EVALUATION  
AND CHEMICAL ANALYSES  
OF EFFLUENT:  
NPDES Permit # MA0100633  
Stormwater 2019 Sample

Prepared For:  
Lowell Regional Wastewater  
451 First Street Boulevard  
Lowell, MA 01854

July 2, 2019

By  
New England Testing Laboratory, Inc.  
59 Greenhill Street  
West Warwick, RI 02893

NETLAB CASE NUMBER: 9F11018



New England Bioassay

A Division of GZA



## NEW ENGLAND BIOASSAY A DIVISION OF GZA ACUTE AQUATIC TOXICITY TEST REPORT

Permittee: Lowell RWU NPDES # MA0100633  
Report submitted to: New England Testing Laboratories  
59 Greenhill St, West Warwick RI 02893  
Sample ID: Effluent  
Test Month/Year: June 2019  
NEB Proj # 05.0044476.00

Test Type / Method: *Ceriodaphnia dubia* Acute Static Non-Renewal Freshwater  
Test Method 2002.0; EPA 821-R-02-012

Effluent Sample Date (s): 6/11/19 Time (s): 0900

Test Start Date: 6/11/19

### Results Summary

Your results were as follows:

Passed all permit limits

### Acute Test Results

Species	LC50	A-NOEC	Permit Limit	Pass / Fail
<i>Ceriodaphnia dubia</i>	>100%	100%	≥ 100%	Pass

Data Qualifiers affecting this test:

Certifications & Approvals: NH ELAP (2071), NJ DEP (CT405)

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## TEST REPORT CERTIFICATION

Permittee name: Lowell RWU Permit number: MA0100633  
Client sample ID: Effluent Test Start Date: 6/11/19

### Whole Effluent Toxicity Test Report Certification (Permittee)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: \_\_\_\_\_  
(Date)

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Print or Type Name and Title

\_\_\_\_\_  
Print or Type the Permittee's Name

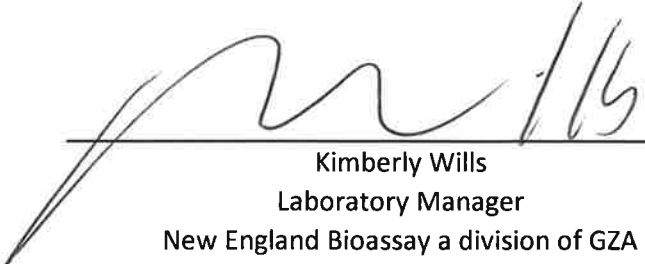
MA0100633  
\_\_\_\_\_  
Print or Type the NPDES Permit Number

### Whole Effluent Toxicity Test Report Certification (Bioassay Laboratory)

The results reported relate only to the samples submitted as received

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: 7/1/19  
(Date)

  
\_\_\_\_\_  
Kimberly Wills  
Laboratory Manager  
New England Bioassay a division of GZA

## GENERAL TEST CONDITIONS

Permittee name: Lowell RWU Permit number: MA0100633  
Client sample ID: Effluent Test Start Date: 6/11/19

### Sample Collection Information

Effluent Sample Date (s): 6/11/19 Time (s): 0900

Were samples used within the first 36 hours of collection? Yes ☒ No ☐ \* (see note below)

\* sample collection note:

### Test Conditions

Permittee's Receiving Water: N/A

*Ceriodaphnia dubia*

- Dilution water: Laboratory synthetic soft water (hardness 45 - 55 mg/L CaCO<sub>3</sub>)
- Control water: N/A

Effluent concentrations tested: 0%, 6.25%, 12.5%, 25%, 50%, 100%

Was effluent salinity adjusted? No ☒ Yes ☐ with Instant Ocean sea salts to \_\_\_\_\_ ppt

Dechlorination procedures: Chlorine is measured using 4500 CL-G DPD Colorimetric Method

- Dechlorination was not required

TRC results and further information about aeration of samples can be found attached in "sample receipt chemistry"

### Reference Toxicant Data

*Ceriodaphnia dubia*

Date: 6/3/19  
Toxicant: Sodium chloride  
Dilution Water: NEB Soft Water  
Organism Source: NEB  
Survival 48-h LC50: 1.86 g/L  
Results within range Yes ☒ No ☐

## TEST RESULTS

Permittee name: Lowell RWU Permit number: MA0100633  
Client sample ID: Effluent Test Start Date: 6/11/19

### Test Acceptability Criteria

Diluent Control Survival: 100 %  
Thiosulfate Control Survival: N/A %

Presence of an asterisk (\*) indicates EPA criteria was not met, see explanation in the "Results Discussion" section

### Test Results

	Results	Permit Limit	Pass/Fail
48 hr LC50	>100%	≥ 100%	Pass
Upper Confidence Limit	$\pm\infty$		
Lower Confidence Limit	100%		
Method Used	Graphical		
48 hr A-NOEC	100%		

Presence of an asterisk (\*) indicates qualified data, see explanation in the "Results Discussion" section

### Concentration - Response Evaluation

Survival: #11 No concentration-response curve: no mortality observed at any concentration.

The concentration - response relationship was reviewed and the following determination was made:

- ☒ Results are reliable and reportable  
☐ Results are anomalous (see explanation below)  
☐ Results are inconclusive - retest (see explanation below)

### Results Discussion (if applicable)

Not Applicable

# TEST METHODS

## ***Ceriodaphnia dubia***

<b>Test type:</b>	Acute Static Non-Renewal Freshwater Test
<b>Test Reference Manual:</b>	EPA-821-R-02-012 "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms and Marine Organisms"
<b>Test Method:</b>	<i>Ceriodaphnia dubia</i> Survival Acute Toxicity Test - EPA 2002.0
<b>Temperature:</b>	25 °C ± 1°C (Temperatures should not deviate by more than 3°C during the test) (required)
<b>Light Quality:</b>	Ambient Laboratory Illumination (recommended)
<b>Light Intensity:</b>	10-20 µE/m <sup>2</sup> /s, or 50-100 ft-c (recommended)
<b>Photoperiod:</b>	16 hours light, 8 hours dark (recommended)
<b>Test chamber size:</b>	30 mL (recommended minimum)
<b>Test solution volume:</b>	25 mL (recommended minimum)
<b>Age of Test Organisms:</b>	Less than 24 hours old (required)
<b>Number of Daphnids Per Test Chamber:</b>	5 (required minimum)
<b>Number of Replicate Test Chambers Per Treatment:</b>	4 (required minimum)
<b>Feeding Regime:</b>	None
<b>Aeration:</b>	None (recommended)
<b>Test Duration:</b>	48 hours
<b>Endpoints:</b>	Survival - 48 hour LC50 and NOAEL
<b>Test Acceptability:</b>	≥ 90% survival of test organisms in controls (required)
<b>Sampling Requirements:</b>	Maximum holding time of 36 hours before first use
<b>Sample volume required:</b>	1 L (recommended)



# DATASHEETS & STATISTICAL ANALYSIS

**NEW ENGLAND BIOASSAY  
ACUTE TOXICITY DATA FORM**

CLIENT: New England Testing Labs  
ADDRESS: 59 Greenhill Street  
West Warwick, RI 02893  
PERMITTEE: Lowell RWU  
PERMIT NUMBER: MA0100633  
DILUTION WATER: Soft Laboratory Synthetic

*C.dubia* TEST ID # 19-745  
CHAIN OF CUSTODY # C39-2323  
NEB PROJECT # 05.0044476.00  
SAMPLE ID: Effluent

**INVERTEBRATES**

TEST SET-UP TECHNICIAN: PD  
TEST SPECIES: *Ceriodaphnia dubia*  
NET LOT # Cd19(6-11)  
AGE: <24 hrs  
TEST SOLUTION VOLUME (mls): 30  
ORGANISMS PER TEST CHAMBER: 5  
ORGANISMS PER CONCENTRATION: 20

	DATE	TIME
TEST START:	6/11/19	1547
TEST END:	6/13/19	1545

**LABORATORY CONTROL WATER ( SRCF )**

Lot Number	Hardness mg/L CaCO <sub>3</sub>	Alkalinity mg/L CaCO <sub>3</sub>
C39-S012	50	35

COMMENTS:

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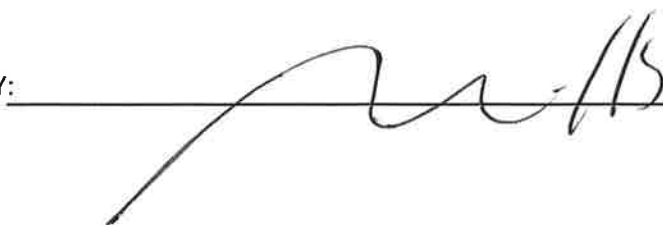
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REVIEWED BY:



DATE:

7/1/19

**NEW ENGLAND BIOASSAY**  
***Ceriodaphnia dubia* TEST DATASHEET**

Facility Name: Lowell RWU NEB Test ID: 19-745  
 NEB Project # 05.0044476.00 Test Start Date: 6/11/19

Effluent Concentration (%)	Number of Surviving Organisms			Dissolved Oxygen (mg/L)			Temperature ( °C )			pH (s.u.)		
Hours	0	24	48	0	24	48	0	24	48	0	24	48
Diluent A	5	5	5	8.2	8.5	8.0	25.1	24.9	25.5	7.6	7.9	7.8
Diluent B	5	5	5			8.1			25.6			7.8
Diluent C	5	5	5			8.1			25.6			7.8
Diluent D	5	5	5			8.1			25.6			7.8
6.25 A	5	5	5	8.2	8.0	8.1	25.1	25.1	25.4	7.5	7.8	7.7
6.25 B	5	5	5			8.2			25.3			7.7
6.25 C	5	5	5			8.2			25.8			7.7
6.25 D	5	5	5			8.3			25.3			7.7
12.5 A	5	5	5	8.2	7.8	8.3	25.0	25.1	25.1	7.5	7.7	7.7
12.5 B	5	5	5			8.2			25.1			7.7
12.5 C	5	5	5			8.2			25.1			7.7
12.5 D	5	5	5			8.2			24.6			7.7
25 A	5	5	5	8.2	7.6	8.1	25.1	25.0	24.8	7.4	7.6	7.6
25 B	5	5	5			8.1			25.0			7.6
25 C	5	5	5			8.1			25.0			7.6
25 D	5	5	5			7.9			25.0			7.6
50 A	5	5	5	8.2	7.3	7.2	25.1	25.1	25.3	7.3	7.5	7.5
50 B	5	5	5			7.2			25.2			7.5
50 C	5	5	5			7.1			25.2			7.5
50 D	5	5	5			7.2			25.4			7.4
100 A	5	5	5	8.1	5.8	6.3	25.1	25.1	25.8	7.1	7.5	7.4
100 B	5	5	5			6.0			25.8			7.3
100 C	5	5	5			6.0			25.6			7.3
100 D	5	5	5			6.1			25.9			7.4
Technician Initials	PD	KO		PD	KO		PD	KO		PD	KO	

# CETIS Analytical Report

Report Date: 19 Jun-19 10:13 (p 1 of 2)  
Test Code/ID: 19-745 / 08-5582-3630

Ceriodaphnia 48-h Acute Survival Test				New England Bioassay	
Analysis ID:	20-8916-0959	Endpoint:	48h Survival Rate	CETIS Version:	CETISv1.9.4
Analyzed:	19 Jun-19 10:13	Analysis:	Linear Interpolation (ICPIN)	Status Level:	1
Batch ID:	10-3636-9246	Test Type:	Survival (48h)	Analyst:	
Start Date:	11 Jun-19 15:47	Protocol:	EPA/821/R-02-012 (2002)	Diluent:	Laboratory Water
Ending Date:	13 Jun-19 15:45	Species:	Ceriodaphnia dubia	Brine:	
Test Length:	48h	Taxon:	Branchiopoda	Source:	In-House Culture
					Age: <24
Sample ID:	06-5258-1611	Code:	26E59AEB	Project:	
Sample Date:	11 Jun-19 09:00	Material:	stormwater	Source:	Lowell RWWU (MA0100633)
Receipt Date:	11 Jun-19 14:35	CAS (PC):		Station:	
Sample Age:	7h	Client:	New England Testing Labs		

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	7394	200	Yes	Two-Point Interpolation

## Test Acceptability Criteria

		TAC Limits		Overlap	Decision
Attribute	Test Stat	Lower	Upper		
Control Resp	1	0.9	>>	Yes	Passes Criteria

## Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

## 48h Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	D	4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	20/20	1	0.0%
6.25		4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	20/20	1	0.0%
12.5		4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	20/20	1	0.0%
25		4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	20/20	1	0.0%
50		4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	20/20	1	0.0%
100		4	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	20/20	1	0.0%

## 48h Survival Rate Detail

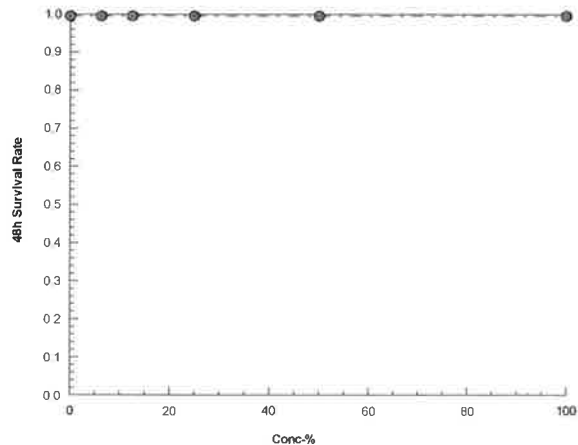
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

## 48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	5/5	5/5	5/5	5/5
6.25		5/5	5/5	5/5	5/5
12.5		5/5	5/5	5/5	5/5
25		5/5	5/5	5/5	5/5
50		5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5

Ceriodaphnia 48-h Acute Survival Test		New England Bioassay	
Analysis ID:	20-8916-0959	Endpoint:	48h Survival Rate
Analized:	19 Jun-19 10:13	Analysis:	Linear Interpolation (ICPIN)
		CETIS Version:	CETISv1.9.4
		Status Level:	1

Graphics



# CETIS Analytical Report

Report Date: 19 Jun-19 10:13 (p 1 of 2)  
Test Code/ID: 19-745 / 08-5582-3630

Ceriodaphnia 48-h Acute Survival Test				New England Bioassay	
Analysis ID:	10-3088-6770	Endpoint:	48h Survival Rate	CETIS Version:	CETISv1.9.4
Analyzed:	19 Jun-19 10:13	Analysis:	Nonparametric-Control vs Treatments	Status Level:	1
Batch ID:	10-3636-9246	Test Type:	Survival (48h)	Analyst:	
Start Date:	11 Jun-19 15:47	Protocol:	EPA/821/R-02-012 (2002)	Diluent:	Laboratory Water
Ending Date:	13 Jun-19 15:45	Species:	Ceriodaphnia dubia	Brine:	
Test Length:	48h	Taxon:	Branchiopoda	Source:	In-House Culture
					Age: <24
Sample ID:	06-5258-1611	Code:	26E59AEB	Project:	
Sample Date:	11 Jun-19 09:00	Material:	stormwater	Source:	Lowell RWWU (MA0100633)
Receipt Date:	11 Jun-19 14:35	CAS (PC):		Station:	
Sample Age:	7h	Client:	New England Testing Labs		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Angular (Corrected)	C > T	100	>100	n/a	1

## Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	18	10	1	6	Asymp	0.8333	Non-Significant Effect
		12.5	18	10	1	6	Asymp	0.8333	Non-Significant Effect
		25	18	10	1	6	Asymp	0.8333	Non-Significant Effect
		50	18	10	1	6	Asymp	0.8333	Non-Significant Effect
		100	18	10	1	6	Asymp	0.8333	Non-Significant Effect

## Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	5	65540	<1.0E-37	Significant Effect
Error	0	0	18			
Total	0		23			

## 48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
12.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%

## Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.00%	0.00%
6.25		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.00%	0.00%
12.5		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.00%	0.00%
25		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.00%	0.00%
50		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.00%	0.00%
100		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.00%	0.00%

# CETIS Analytical Report

Report Date: 19 Jun-19 10:13 (p 2 of 2)  
Test Code/ID: 19-745 / 08-5582-3630

## Ceriodaphnia 48-h Acute Survival Test

New England Bioassay

Analysis ID: 10-3088-6770 Endpoint: 48h Survival Rate CETIS Version: CETISv1.9.4  
Analyzed: 19 Jun-19 10:13 Analysis: Nonparametric-Control vs Treatments Status Level: 1

### 48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

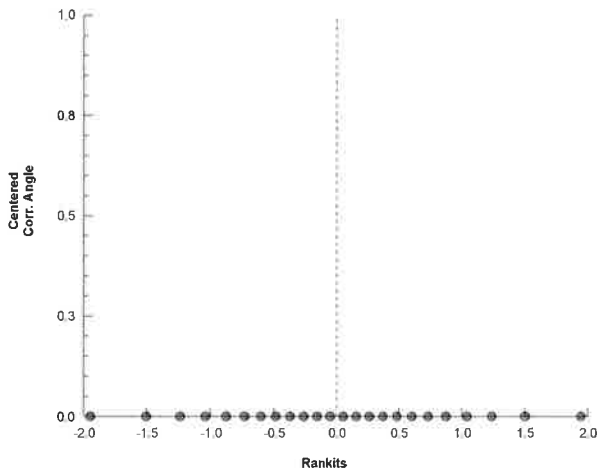
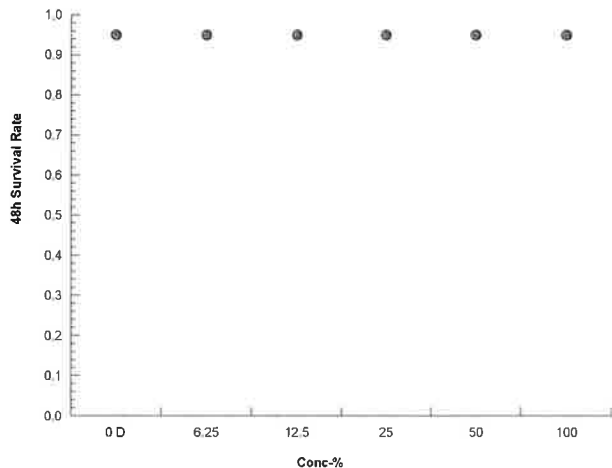
### Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.345	1.345	1.345	1.345
6.25		1.345	1.345	1.345	1.345
12.5		1.345	1.345	1.345	1.345
25		1.345	1.345	1.345	1.345
50		1.345	1.345	1.345	1.345
100		1.345	1.345	1.345	1.345

### 48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	5/5	5/5	5/5	5/5
6.25		5/5	5/5	5/5	5/5
12.5		5/5	5/5	5/5	5/5
25		5/5	5/5	5/5	5/5
50		5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5

## Graphics



# SAMPLE RECEIPT CHEMISTRY & CHAIN OF CUSTODY DOCUMENTS



# NEW ENGLAND BIOASSAY INITIAL CHEMISTRY DATA

PERMITTEE: Lowell RWU  
NEB PROJECT # 05.0044476.00

DATE RECEIVED	6/11/19	
SAMPLE TYPE:	EFFLUENT	
COC #	C39-2323	
pH (SU)	6.7	
Temperature (°C)	7.9	
Dissolved Oxygen (mg/L)	8.7	
Conductivity (µmhos)	864	
Salinity (ppt)	<1	
TRC - DPD (mg/L)	0.035	
TRC - Amperometric	N/A	
Hardness (mg/L as CaCO <sub>3</sub> )	76	
Alkalinity (mg/l as CaCO <sub>3</sub> )	70	
Tech Initials	KO	

NOTE: NA = NOT APPLICABLE

Additional Notes:

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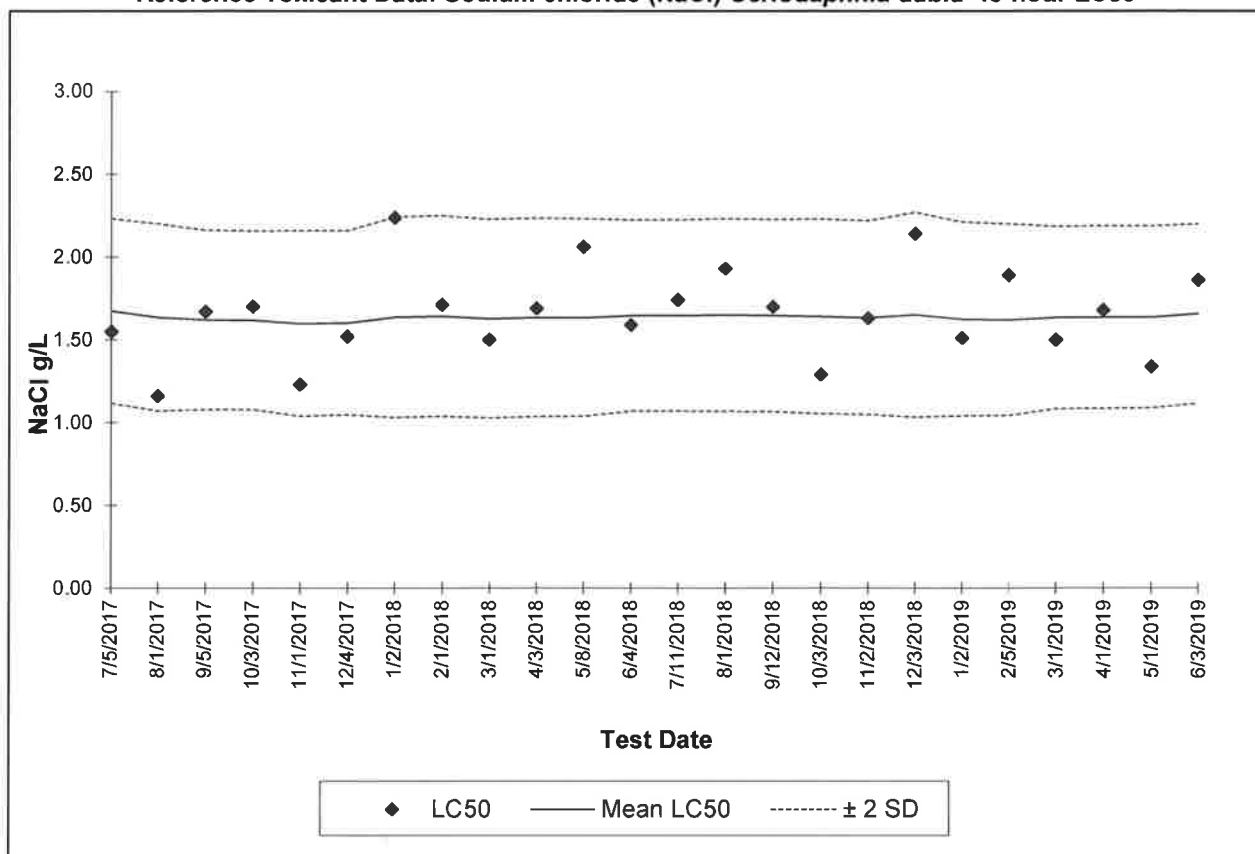
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# REFERENCE TOXICANT CHARTS

**New England Bioassay**  
**Reference Toxicant Data: Sodium chloride (NaCl) *Ceriodaphnia dubia* 48-hour LC50**



Test ID	Date	LC <sub>50</sub>	Mean LC <sub>50</sub>	STD	-2 STD	+2 STD	CV	CV National 75th %	CV National 90th %
17-968	7/5/2017	1.55	1.67	0.28	1.12	2.23	0.17	0.29	0.34
17-1140	8/1/2017	1.16	1.64	0.28	1.07	2.20	0.17	0.29	0.34
17-1325	9/5/2017	1.67	1.62	0.27	1.08	2.16	0.17	0.29	0.34
17-1521	10/3/2017	1.70	1.62	0.27	1.08	2.16	0.17	0.29	0.34
17-1689	11/1/2017	1.23	1.60	0.28	1.04	2.16	0.18	0.29	0.34
17-1828	12/4/2017	1.52	1.60	0.28	1.05	2.16	0.17	0.29	0.34
18-5	1/2/2018	2.24	1.64	0.30	1.03	2.24	0.18	0.29	0.34
18-179	2/1/2018	1.71	1.64	0.30	1.04	2.25	0.18	0.29	0.34
18-290	3/1/2018	1.50	1.63	0.30	1.03	2.23	0.18	0.29	0.34
18-465	4/3/2018	1.69	1.64	0.30	1.04	2.24	0.18	0.29	0.34
18-653	5/8/2018	2.06	1.64	0.30	1.04	2.23	0.18	0.29	0.34
18-749	6/4/2018	1.59	1.65	0.29	1.07	2.23	0.18	0.29	0.34
18-993	7/11/2018	1.74	1.65	0.29	1.07	2.22	0.18	0.29	0.34
18-1099	8/1/2018	1.93	1.65	0.29	1.07	2.23	0.18	0.29	0.34
18-1319	9/12/2018	1.70	1.65	0.29	1.07	2.23	0.18	0.29	0.34
18-1492	10/3/2018	1.29	1.64	0.29	1.05	2.23	0.18	0.29	0.34
18-1621	11/2/2018	1.63	1.64	0.29	1.05	2.22	0.18	0.29	0.34
18-1751	12/3/2018	2.14	1.65	0.31	1.03	2.27	0.19	0.29	0.34
19-3	1/2/2019	1.51	1.63	0.29	1.04	2.21	0.18	0.29	0.34
19-170	2/5/2019	1.89	1.62	0.29	1.04	2.20	0.18	0.29	0.34
19-259	3/1/2019	1.50	1.64	0.28	1.08	2.19	0.17	0.29	0.34
19-401	4/1/2019	1.68	1.64	0.28	1.09	2.19	0.17	0.29	0.34
19-548	5/1/2019	1.34	1.64	0.27	1.09	2.19	0.17	0.29	0.34
19-684	6/3/2019	1.86	1.66	0.27	1.12	2.20	0.16	0.29	0.34

## Results:

**Sample: Semi Annual Whole Effluent  
9F11018-01 (Water)**

### General Chemistry

	Result	Reporting Limit	Units	Date Analyzed
<b>Ammonia</b>	<b>8.4</b>	0.5	mg/L	06/18/19
<b>Kjeldahl Nitrogen</b>	<b>5.6</b>	1.0	mg/L	06/19/19
<b>Nitrate and Nitrite as N</b>	<b>1.13</b>	0.03	mg/L	06/12/19
<b>Total Dissolved Solids</b>	<b>384</b>	10	mg/L	06/19/19
<b>Total Organic Carbon</b>	<b>14.5</b>	1.0	mg/L	06/12/19
<b>Total Phosphorous</b>	<b>2.23</b>	0.04	mg/L	06/17/19
<b>Total solids (TS)</b>	<b>496</b>	10	mg/L	06/12/19
<b>Total Suspended Solids</b>	<b>62</b>	5	mg/L	06/12/19

### Total Metals

	Result	Reporting Limit	Units	Date Analyzed
<b>Calcium</b>	<b>28.0</b>	0.05	mg/L	06/13/19
<b>Magnesium</b>	<b>3.21</b>	0.05	mg/L	06/13/19
<b>Aluminum</b>	<b>0.239</b>	0.005	mg/l	06/18/19
Cadmium	ND	0.0005	mg/L	06/17/19
<b>Copper</b>	<b>0.020</b>	0.005	mg/l	06/17/19
Nickel	ND	0.005	mg/l	06/17/19
<b>Lead</b>	<b>0.0033</b>	0.0005	mg/L	06/17/19
<b>Zinc</b>	<b>0.101</b>	0.005	mg/l	06/17/19
<b>Total Hardness</b>	<b>83.1</b>	0.125	mg/L	06/13/19

*Stormwater*  
**NEW ENGLAND BIOASSAY**  
**CHAIN-OF-CUSTODY**

**EFFLUENT**

Sampler: JIN BOK MCGOWAN  
Title: CHEMIST  
Facility: Lowell Regional Wastewater Utility  
Address: First Street Blvd. Route 110  
Lowell, MA 01850

**RECEIVING WATER**

Sampler: \_\_\_\_\_  
Title: \_\_\_\_\_  
Facility: Lowell Regional Wastewater Utility  
Address: First Street Blvd. Route 110  
Lowell, MA 01850

**Sample Information**

Collection Method: ☒ Grab  
☐ Composite  
Sample ID: PLT EFF  
Start & End Dates: 6-11-2017 9:00 AM  
Start & End Times: \_\_\_\_\_  
Type of Sample: ☒ WWTF Effluent  
☐ Industrial Effluent  
☐ Other \_\_\_\_\_  
Is the sample: ☒ Prechlorinated  
☐ Dechlorinated  
☐ Chlorine spiked in lab  
☐ Unchlorinated

Received  
**ON ICE**

Site Description: \_\_\_\_\_  
\_\_\_\_\_

Sample Collection Procedures: \_\_\_\_\_  
\_\_\_\_\_

**Sample Shipment**

Method of Shipment: UPS  
Relinquished By: [Signature] Date: 6-11-2017 Time: 11:20 AM  
Received By: B. Placheco Date: 6/11/19 Time: 11:20 AM  
Relinquished By: [Signature] Date: 6/11/19 Time: 12:00 PM  
Received By: [Signature] Date: 6/11/19 Time: 1400  
1435

FOR NEB USE ONLY  
Rec'd: gcj/mul 6/11/19 @ 1435  
Temperature of Effluent Upon Receipt at Lab: 7.9 °C  
Effluent COC# C39-2323

**IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:  
KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042**